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| 10/594,886 | 09/29/2006 | Hideki Soya | SUT-0307 | 8132 |

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| EXAMINER | |
|---|---|
| WILLIAMS, DON J | |
| ART UNIT | PAPER NUMBER |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/594,886 | SOYA, HIDEKI | |
| | Examiner | Art Unit | |
| | DON WILLIAMS | 2878 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *04 March 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 September 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Response to Arguments*

Applicant's arguments with respect to claim 1-16 have been considered but are moot in view of the new ground(s) of rejection.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 10-12, 14, and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Yasuda et al (5,949,099).

As to claims 10, 14, Yasuda et a disclose (fig. 1) a light receiver (11, 12) for receiving light by converting incident light into electric signals, a readout unit (15, 19, 20) for reading the electric signals acquired from the light receiver (11, 12), and a plurality of storage units (ST, 16) for storing the electric signals read by the readout units (15, 16, 20), characterized in that the light receiver (11, 12), the readout unit (15, 19, 20) and the plurality of storage units (ST, 16) are arranged in series, and a first drain structure (22) is disposed adjacent a storage unit (ST, 16), adjacent the readout unit (15, 19) or the readout unit (15, 19, 20) for discharging excess part of the electric signals read by the

readout unit (15, 19), (column 4, lines 33-40, lines 48-58, column 5, lines 16-23, lines 39-40).

As to claims 11, 15, Yasuda et al disclose (fig. 1) a second drain structure (22) disposed adjacent the light receiver (11, 12) for discharging excess part of the electric signals in the light receiver (11, 12), (column 4, lines 33-40, column 5, lines 39-40).

As to claim 12, Yasuda et al disclose that the light receiver (11, 12) is a photodiode, (column 4, lines 33-37).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yasuda et al (5,949,099) in view of Miura (5,379,067).

As to claims 1, 6, Yasuda et al disclose (fig. 1) a light receiver (11, 12) for receiving light by converting incident light into electric signals, and a readout unit (15, 19, 20) for reading the electric signals acquired from the light receiver (11, 12), (column 4, lines 33-40, lines 50-54, column 5, lines 16-23). Yasuda et al also disclose (fig. 4, fig. 5) that the potential of the first region (15a) of the read gate (15) changes from the deep state (RH) to the shallow state (RL), (column 6, lines 20-21). Yasuda et al is silent of explicitly disclosing a potential gradient. Miura discloses (fig. 5) that the potentials of the

photosensitive portions (1a, 1b) can be sloped down toward the readout gate electrodes (2a, 2b) by the impurity diffused regions (11) and that the potential gradient can increase the transfer efficiency of the signals charges (e), and prevent part of the charges from remaining within the photosensitive portions (1a, 1b), (column 3, lines 50-57). It would have been obvious for one of ordinary skill in the art to modify Yasuda et al in view of Miura to include a potential gradient corresponding to the electric charge generated by the light receiver resulting in the transfer of electric signals at a high rate of speed to a readout unit allowing the device to perform at an optimal level.

As to claims 2, 3, 7, 8, Miura discloses (fig. 3) the impurity diffused region (11) acts to continuously widen the width (D) of the N-type photosensitive portions (1a, 1b) toward the readout gate electrodes (2a, 2b) which constitutes the potential gradient gradually enlarging a width and densities of impurities forming the light receiver, (column 3, lines 47-55).

As to claim 4, Yasuda et al disclose (fig. 4) light receiver (11, 12) are each a photoelectric conversion element such as a photodiode, (column 4, lines 32-36).

As to claim 5, Yasuda et al disclose (fig. 4) light receiver (11, 12) are each a photoelectric conversion element such as a photodiode, (column 4, lines 32-36). Yasuda et al in view of Miura is silent of explicitly disclosing a photogate. Photogates, photodiodes, photosensors, photodetectors, photoreceptors, and phototransistors are well known in the art for being used as optical elements that receive and convert light in to electrical signals. It would have been obvious for one of ordinary skill in the art to use a photogate as a light receiver element in order to convert light into an electrical signal

for further processing resulting in transferring electric signals at a high speed to a readout unit.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yasuda et al (5,949,099) in view of Miura (5,379,067) and further in view of Mizutani et al (6,144,407).

As to claim 9, Yasuda et al disclose (fig. 1) an imaging apparatus (solid state image sensing device) that takes in optical images (light) with light receiver (11, 12) converting the take-in optical images (light) into electric signals, (column 4, lines 33-40). Yasuda et al in view of Miura fail to explicitly disclose a photographic subject and a crystalline lens for taking in the optical images of photographic subject. Mizutani et al disclose (fig. 2) a solid-state image pickup device (11), and a lens (13) that is placed in front of the solid-state image pickup device (11) which allows light from the outside to incident through the lens (13) to project an image of a subject on the light receiving and charge transfer portion, (column 6, lines 56-62). It would have been obvious for one of ordinary skill in the art to modify Yasuda et al in view of Miura and further in view of Mizutani et al to use the lens as a crystalline lens for taking in the optical images of the photographic subject allowing the image sensor to function at an optimal level resulting in clear and precise images of the photographic subject.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yasuda et al (5,949,099).

As to claim 13, Yasuda et al disclose that light receiver (11, 12) is a photodiode. Yasuda et al is silent of explicitly disclosing that the light receiver is a photogate. Photogates, photodiodes, photosensors, photodetectors, photoreceptors, and phototransistors are well known in the art for being used as optical elements that receive and convert light into electrical signals. It would have been obvious for one of ordinary skill in the art to use a photogate as a light receiver element in order to convert light into an electrical signal for further processing resulting in transferring electric signals at a high rate of speed to a readout unit.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yasuda et al (5,949,099) in view of Mizutani et al (6,144,407).

As to claim 16, Yasuda et al disclose (fig. 1) an imaging apparatus (solid state image sensing device) that takes in optical images (light) with light receiver (11, 12) converting the take-in optical images (light) into electric signals, (column 4, lines 33-40). Yasuda et al fail to explicitly disclose a photographic subject and a crystalline lens for taking in the optical images of photographic subject. Mizutani et al disclose (fig. 2) a solid-state image pickup device (11), and a lens (13) that is placed in front of the solid-state image pickup device (11) which allows light from the outside to incident through the lens (13) to project an image of a subject on the light receiving and charge transfer portion, (column 6, lines 56-62). It would have been obvious for one of ordinary skill in the art to modify Yasuda et al in view of Mizutani et al to use the lens as a crystalline lens for taking in the optical images of the photographic subject allowing the image

sensor to function at an optimal level resulting in clear and precise images of the photographic subject.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DON WILLIAMS whose telephone number is (571)272-8538. The examiner can normally be reached on 8:30a.m. to 5:30a.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on 571-272-2328. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Don Williams/
Examiner, Art Unit 2878

/Georgia Y Epps/
Supervisory Patent Examiner, Art Unit 2878